

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 6

Dkt. 71341/JPW/PT

REMARKS

Claims 1-19 were pending in the subject application. Claims 14-19 were withdrawn by the Patent Office from consideration. By this Amendment, claims 1, 3, 6, 9 and 12 have been amended to clarify the claimed invention. Accordingly, claims 1-13 are presented for reconsideration, with claim 1 being in independent form.

Support for the claim amendments may be found, inter alia, in the specification at page 19, line 27 through page 20, line 3. Further support for the claim amendments may be found, inter alia, in Table 1 on page 35.

Applicant maintains that no new matter is presented by this amendment. Accordingly, Applicant respectfully requests that this Amendment be entered.

Rejection under 35 U.S.C. §112, second paragraph

On Page 3 of the November 28, 2005 Office Action, claims 6 and 9-12 were rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite.

Regarding claim 6, the Examiner stated that the phrase "excessively large" renders the claim indefinite because it is unclear what exactly is excessively large relative to a stoichiometric amount.

The Examiner stated that claim 9 recites the limitation "the raw material" in line 2 and that there is insufficient antecedent basis for this limitation in the claim.

The Examiner stated that claim 10 recites the limitation "the raw material" in lines 2-3 and that there is insufficient antecedent basis for this limitation in the claim.

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 7

Dkt. 71341/JPW/PT

The Examiner stated that claim 11 recites the limitation "the raw material" in line 2 and that there is insufficient antecedent basis for this limitation in the claim.

Regarding claim 12, the Examiner stated that the phrase "excessively large" renders the claim indefinite and that it is unclear what exactly is excessively large relative to a stoichiometric amount.

By this Amendment, claims 6, 9 and 12 have been amended to clarify the claimed invention.

Claims 10 and 11 depend from claim 9, and references to "the raw material" in claims 10 and 11 derive their respective antecedent bases from claim 9.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of the claims under 35 U.S.C. §112, second paragraph.

Rejection Under 35 U.S.C. §102(b)

On Page 4 of the November 28, 2005 Office Action, claims 1 and 3 were rejected under 35 U.S.C. §102(b) as purportedly anticipated by U.S. Patent No. 4,023,059 to Anderson.

Regarding claim 1, the Examiner stated that Anderson discloses a metal halide lamp in figure 3, including: a discharge container (item 203) including a discharge space and sealing sections formed at both edges of the discharge space; pair of electrodes (items 213 and 214) arranged within the discharge space and held sections; and discharge medium sealed in the discharge container, containing a light-emitting material formed of a metal halide and a rare gas, and essentially free from mercury, wherein the amount

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 8

Dkt. 71341/JPW/PT

of water contained the metal halide in the extinguishing stage of the metal halide lamp not larger than 50 ppm.

Regarding claim 3, the Examiner stated that Anderson discloses a metal halide lamp according to claim 1, wherein raw material of the metal halide having a water content not higher than 100 ppm is sealed in the discharge space

Applicant maintains that the claimed invention cannot be anticipated by Anderson because Anderson fails to disclose each and every element of the claimed invention.

The present application relates to metal halide lamps free from Hg. In the metal halide lamp which does not include mercury, a metal halide, which serves as an alternative to mercury, is filled in surplus to maintain the lamp voltage at a predetermined level. Accordingly, the amount of metal halides to be filled in the lamp is relatively increased. If the amount of metal halides is increased, the amount of water is restricted in order to improve the lamp characteristics.

For example, claim 1 is directed to a metal halide lamp comprising a discharge container, a pair of electrodes and a discharge medium. The discharge container includes a discharge space and sealing sections formed at both edges of the discharge space. The electrodes are arranged to face each other within the discharge space and held in the sealing sections. The discharge medium sealed in the discharge container contains a light-emitting material formed of a metal halide and a rare gas and is free from mercury. The amount of water contained in the metal halide in the extinguishing stage of the metal halide lamp is not larger than 20 ppm. By limiting the amount of water as such, the luminous flux maintenance rate greatly improves.

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 9

Dkt. 71341/JPW/PT

Anderson does not disclose or suggest the claimed invention of claim 1. Anderson, as understood by Applicant, is directed to a high pressure light emitting electric discharge device which contains mercury (Hg) [see Anderson, column 7, lines 43-46].

Regarding claim 3, Applicant respectfully points out that claim 3 depends on and includes all the limitations of claim 1. Thus, claim 3 is patentable at least for the reasons set forth above with respect to claim 1.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 1 and 3 under 35 U.S.C. §102(e).

Rejection Under 35 U.S.C. §103(a)

On Page 4 of the November 28, 2005 Office Action, claims 2, 6-9, 12 and 13 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Anderson in view of U.S. Patent No. 6,353,289 to Ishigami et al.

Regarding claim 2, the Examiner acknowledged that Anderson does not disclose or suggest that the metal halide includes at least a halide of zinc.

The Examiner stated that Ishigami is cited to show a metal halide lamp that has a metal halide of at least zinc. The Examiner also stated that Ishigami teaches that a halide of zinc can act as a buffer gas and the metal is unlikely to emit a visible light compared with the metal another halide.

The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Anderson to include a halide of zinc as purportedly suggested by Ishigami for acting as a buffer gas and to help not emit visible

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 10

Dkt. 71341/JPW/PT

light.

Regarding claim 6, the Examiner acknowledged that Anderson does not disclose or suggest that the metal halide contains an excessively large amount of metal component relative to the stoichiometric amount.

The Examiner stated that Ishigami is cited to show a metal halide lamp with an excessively large amount of metal component relative to the stoichiometric amount. The Examiner also stated that Ishigami teaches that certain values will give better light efficiency and color rendering properties.

The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Anderson to include an excessively large amount of metal component relative to the stoichiometric amount as purportedly suggested by Ishigami for having better light efficiency and color rendering properties.

Regarding claim 7, the Examiner acknowledged that Anderson does not disclose or suggest that the light-emitting material includes a first metal halide formed of a halide of at least one metal selected from the group consisting of sodium, scandium and a rare earth element, and a second metal halide formed of a halide of at least one metal selected from the group consisting of zinc, magnesium, iron, cobalt, chromium, nickel, manganese, aluminum, antimony, beryllium, rhenium, gallium, titanium, zirconium and hafnium.

The Examiner stated that Ishigami is cited to show a metal halide lamp with a light-emitting material including a first metal halide formed of a halide of at least one metal selected from the group consisting of sodium, scandium and a rare earth element, and

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 11

Dkt. 71341/JPW/PT

a second metal halide formed of a halide of at least one metal selected from the group consisting of zinc, magnesium, iron, cobalt, chromium, nickel, manganese, aluminum, antimony, beryllium, rhenium, gallium, titanium, zirconium and hafnium. The Examiner also stated that Ishigami teaches that having the first halide from the group of sodium, scandium, and a rare earth element in combination with the second halide having a relatively high vapor pressure and being a halide of at least one metal, then it will be unlikely that the second halide will emit a visible light compared with the first halide.

The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Anderson to include a light-emitting material that includes a first metal halide formed of a halide of at least one metal selected from the group consisting of sodium, scandium and a rare earth element, and a second metal halide formed of a halide of at least one metal selected from the group consisting of zinc, magnesium, iron, cobalt, chromium, nickel, manganese, aluminum, antimony, beryllium, rhenium, gallium, titanium, zirconium and hafnium as purportedly suggested by Ishigami for helping to control the amount of visible light the second halide emits compared with the first halide.

Regarding claim 8, the Examiner stated that the combination of Anderson and Ishigami discloses a metal halide lamp according to claim 7, wherein the metal halide includes a halide least zinc.

Regarding claim 9, the Examiner stated that the combination of Anderson and Ishigami discloses a metal halide lamp according to claim 7, wherein the raw material of the metal halide having a water content not higher than 100 ppm is sealed in the discharge container.

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 12

Dkt. 71341/JPW/PT

Regarding claim 12, the Examiner stated that the combination of Anderson and Ishigami discloses a metal halide lamp according to claim 7, wherein the metal halide contains an excessively large amount of metal component relative to the stoichiometric amount.

Regarding claim 13, the Examiner stated that the combination of Anderson and Ishigami discloses a headlight apparatus for a vehicle, including: the metal halide lamp according to any one of claims 1 to 12 and a headlight apparatus body for a vehicle having the metal halide lamp arranged therein and having an optical axis extending the longitudinal direction of the discharge container included in the metal halide lamp.

Applicant maintains that Anderson and Ishigami do not render obvious the claimed invention of the present application. The claimed invention is patentable over Anderson and Ishigami for at least the following reasons.

As discussed above, Anderson is directed to a high pressure light emitting electric discharge device which contains mercury, Anderson does not disclose or suggest the claimed invention of claim 1 from which each of claims 2, 6-9, 12 and 13 depend.

Further, since Anderson is directed to a high pressure light emitting electric discharge device which contains mercury, the metal halide lamp provided by the claimed invention of claim 1 of the present application which does not include mercury would not have been obvious from Anderson alone or in combination with one or more of the other cited references.

Ishigami, as understood by Applicant, is directed to a metal halide lamp which does not require mercury sealing.

Applicant does not find teaching or suggestion in Ishigami,

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 13

Dkt. 71341/JPW/PT

however, of a metal halide lamp comprising a discharge container, a pair of electrodes and a discharge medium, wherein the discharge medium sealed in the discharge container contains a light-emitting material formed of a metal halide and a rare gas and is free from mercury, and the amount of water contained in the metal halide in the extinguishing stage of the metal halide lamp is not larger than 20 ppm, as provided by the claimed invention of claim 1 of the present application.

As discussed in Ishigami, metal halide lamps free from mercury are vastly different from lamps which contain mercury and therefore it would not have been obvious to modify the metal halide lamp of Ishigami according to cited art which is directed to lamps containing mercury.

Therefore, the cited art does not disclose or suggest the claimed invention of claim 1 from which each of claims 2, 6-9, 12 and 13 depend.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 2, 6-9, 12 and 13 under 35 U.S.C. §103.

Rejection Under 35 U.S.C. §103(a)

On Page 8 of the November 28, 2005 Office Action, claims 4, 5, 10 and 11 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Anderson in view of Ishigami and further in view of U.S. Patent No. 6,368,175 to Horiuchi.

Regarding claim 4, the Examiner acknowledged that the combination of Anderson and Ishigami does not disclose or suggest that a vacuum heat treatment is applied to the raw material of the metal halide.

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 14

Dkt. 71341/JPW/PT

The Examiner stated that Horiuchi is cited to show a discharge lamp that has a vacuum heat treatment applied. The Examiner also stated that Horiuchi teaches that this step is effective in eliminating water from a metal halide as a light emitting substance which is highly absorptive and also effective in preventing the metal halide lamp from undergoing blackening and devitrification.

The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time of invention to modify the combination of Anderson and Ishigami to include a vacuum heat treatment that can be applied to the raw material of the metal halide as purportedly suggested by Horiuchi for eliminating water from a metal halide as a light emitting substance.

Regarding claim 5, the Examiner acknowledged that the combination of Anderson and Ishigami does not disclose or suggest that a heat treatment is applied to the raw material of the metal halide under an inert gas atmosphere.

The Examiner stated that Horiuchi is cited to show a metal halide lamp that has a heat treatment applied to the raw material of the metal halide under an inert gas atmosphere. The Examiner also stated that Horiuchi teaches that with an inert gas atmosphere, it is more effective in eliminating adsorbed water.

The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time of invention to modify the combination of Anderson and Ishigami for having a heat treatment that is applied to the raw material of the metal halide under an inert gas atmosphere as purportedly suggested by Horiuchi for eliminating adsorbed water.

Regarding claim 10, the Examiner acknowledged that the

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 15

Dkt. 71341/JPW/PT

combination of Anderson and Ishigami does not disclose or suggest that a vacuum heat treatment is applied to the raw material of the metal halide.

The Examiner stated that Horiuchi teaches that this step is effective in eliminating water from a metal halide as a light emitting substance being highly absorptive and also effective in preventing the metal halide lamp from undergoing blackening and devitrification.

The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time of invention to modify the combination of Anderson and Ishigami to include a vacuum heat treatment that is applied to the raw material of the metal halide as purportedly suggested by Horiuchi for eliminating water from a metal halide as a light emitting substance.

Regarding claim 11, the Examiner acknowledged that the combination of Anderson and Ishigami does not disclose or suggest that a heat treatment is applied to the raw material of the metal halide under an inert gas atmosphere.

The Examiner stated that Horiuchi is cited to show a metal halide lamp that has a heat treatment applied to the raw material of the metal halide under an inert gas atmosphere. The Examiner also stated that Horiuchi teaches that with an inert gas atmosphere, it is more effective in eliminating adsorbed water.

The Examiner alleged that it would have been obvious to one of ordinary skill in the art at the time of invention to modify the combination of Anderson and Ishigami for having a heat treatment that is applied to the raw material of the metal halide under an inert gas atmosphere as purportedly suggested by Horiuchi for eliminating adsorbed water.

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 16

Dkt. 71341/JPW/PT

Applicant maintains that Anderson, Ishigami and Horiuchi do not render obvious the invention claimed in claim 1. The claimed invention is patentable over the cited art for at least the following reasons.

As discussed above, Anderson and Ishigami do not teach or suggest a metal halide lamp comprising a discharge container, a pair of electrodes and a discharge medium, wherein the discharge medium sealed in the discharge container contains a light-emitting material formed of a metal halide and a rare gas and is free from mercury, and the amount of water contained in the metal halide in the extinguishing stage of the metal halide lamp is not larger than 20 ppm, as provided by the claimed invention of claim 1 of the present application.

Horiuchi, as understood by Applicant, is directed to a discharge lamp which includes a light-emitting portion formed of quartz glass and a Noble gas hermetically charged in the light-emitting portion. Horiuchi was cited in the Office Action only against claims 4, 5, 10 and 11.

Applicant does not find teaching or suggestion in Ishigami and Horiuchi, however, of a metal halide lamp comprising a discharge container, a pair of electrodes and a discharge medium, wherein the discharge medium sealed in the discharge container contains a light-emitting material formed of a metal halide and a rare gas and is free from mercury, and the amount of water contained in the metal halide in the extinguishing stage of the metal halide lamp is not larger than 20 ppm, as provided by the claimed invention of claim 1 from which each of claims 4, 5, 10 and 11 depend.

Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 4, 5, 10 and 11

Nobuhiro TAMURA et al., S.N. 10/700,399
Page 17

Dkt. 71341/JPW/PT

under 35 U.S.C. §103.


In view of the amendments to the claims and remarks hereinabove, Applicant maintains that the pending claims are in condition for allowance, and earnestly solicits the allowance of the application.

If a telephone interview would be of assistance in advancing prosecution of the subject application, Applicant's undersigned attorneys invite the Examiner to telephone them at the telephone number provided below.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition.

No fee is deemed necessary in connection with the filing of this Amendment. However, if any fees are required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,



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